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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,866	01/18/2002	Kiyoshi Yoshizumi	218209US3	9246
22850 7590 07/18/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
			EXAMINER HODGE, ROBERT W	
			ART UNIT 1745	PAPER NUMBER
			NOTIFICATION DATE 07/18/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/050,866

Applicant(s)

YOSHIZUMI ET AL.

Examiner

Robert Hodge

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1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 8-23 and 32-50 is/are pending in the application.
- 4a) Of the above claim(s) 2-4, 9, 10, 16-20, 22, 23, 32-36, 40-42 and 44-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 8, 11-15, 21, 37-39, 43 and 50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/14/07.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/30/07 has been entered.

Response to Arguments

Applicant's arguments filed 4/30/07 have been fully considered but they are not persuasive. With regards to the rejection of claims 1, 8, 13-15 and 50 under 35 U.S.C. 103(a) as being unpatentable over Boneberg in view of Joerissen applicants state that Boneberg explicitly teaches against the need for a valve and therefore the combination is improper. However as applicants cite from the Boneberg reference, Boneberg only discloses that "there is no need for any further delivery devices for supplying the [anode and cathode] gases". Said disclosure does not teach against valves, but rather delivery devices, which would be blowers, compressors, or pumps. The reason Boneberg makes the statement that no further delivery devices are needed is because they are maintaining the system at a certain pressure therefore Boneberg does not need a device to increase the pressure, however Boneberg does not say anything against devices to restrict flow such as valves. It is submitted that skilled artisans understand

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that all fuel cell systems require the use of valves in order to shut down the system or restrict flow when necessary, and therefore a skilled artisan would be motivated to combine the teachings of Joerissen with Boneberg to add a valve as described in the office action dated 1/29/07. With regards to claims 13 and 15, applicants do not argue that Joerissen does not teach that the control portion is adapted to control the valve, which is clearly taught from the provided German Office Action Translation and is also disclosed in the abstract. Applicants also argue their means plus function language under 35 U.S.C. 112, sixth paragraph and cite case law in their support. However applicants are ignoring the exact directive of 35 U.S.C. 112, sixth paragraph which states:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

It is submitted that the "equivalents thereof" is disclosed in Joerissen. Joerissen clearly teaches opening and closing valves at regular intervals as well as in response to a concentration of hydrogen. There is nothing in the claim that states how the concentration of the hydrogen is determined, said determination can be an indirect means such as by monitoring cell voltage. In the now provided translation of Joerissen it is also disclosed that the controller is a Programmable Logic Controller (PLC), which definitely is an equivalent thereof since a PLC can be programmed to perform any number of tasks and therefore a skilled artisan would be motivated to program the controller to control the fuel cell system appropriately by the input received from the

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system. Therefore not only is Joerissen capable of performing the function of the claimed controller, Joerissen is performing the equivalent function thereof (emphasis added).

With respect to claim 21, applicants' arguments are not commensurate with the grounds of rejection. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boneberg in view of Joerissen and further in view of Heinen. There is no reference to Salvador. Therefore applicants' arguments are not commensurate with the grounds of rejection and cannot be addressed.

With respect to claims 37-39, applicants admit that flow control orifices were known, therefore applicants admit that a skilled artisan would have known about flow control orifices and therefore a skilled artisan would be motivated to use a flow control orifice to control the flow of a gas such as hydrogen.

With respect to the rejection of claims 11 and 12 under 35 U.S.C. 112, first paragraph applicants amendments have been fully considered and are persuasive. The rejection of claims 11 and 12 under 35 U.S.C. 112, first paragraph has been withdrawn.

Claim Objections

Claim 12 is objected to because of the following informalities: Lines 9 and 10 recited "wherein the control portion opens the valve by if the flow rate of the discharged oxygen off gas..." The Examiner is unsure what is meant by "valve by if the flow rate". Appropriate correction is required.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 8, 11-15 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/63993 hereinafter Joerissen et al. in view of U.S. Patent No. 6,696,188 hereinafter Boneberg et al.

Through the now provided translation of WO 00/63993 Joerissen et al. teaches a fuel cell unit 7 that utilizes a metal hydride hydrogen storage device 19 to provide hydrogen to the anode chamber 2 by means of a passage provided with a pressure reduction valve 24. The anode chamber outlet of the fuel cell provides a passage for unreacted hydrogen to be recycled to the anode chamber inlet by means of a pump 9 or exhausted to the atmosphere via a further passage with a valve 7, each of the exhaust passages for discharging anode and cathode off-gas are provided with condensed water separators 8a and 8b, wherein water separator 8a (i.e. flow-rate reducing portion) inherently reduces the flow rate of the exiting anode exhaust and also includes an inherent buffer (i.e. storage of water and an area where the water is separated from the gas). Joerissen et al. also teaches a Programmable Logic Controller 14 that controls the valves and pumps of the system based on input received from the entire system such as cell voltage and temperature which then controls all of the fluid flow streams based on said input by either operating pumps and/or valves that are opened and closed at regular intervals and also according to other factors such as concentration which can be determined indirectly from at least cell voltage. Joerissen et al. further

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teaches a pump 11 (i.e. pressure changing device) in the oxidant inlet stream for the fuel cell to provide oxidant to the fuel cell (see the whole translation of Joerissen, now provided). The Examiner notes that applicants have elected the species of figure 6 and there is only support for a pressure changing device in the seventh flow passage, which is known as the oxidant inlet stream, there is no support in figure 6 for a pressure changing device in the second flow passage, which is known as the oxygen-off gas stream and therefore the limitation of "a flow rate-changing device which is disposed in the second flow passage" has been withdrawn from consideration from claims 11 and 12.

Joerissen does not teach a mixing portion that mixes the anode and cathode exhaust gases.

Boneberg et al. teaches a fuel cell system being supplied with hydrogen and oxygen gases, which in turn generates electric power (column 3, lines 10-15) then mixing the exhaust gas streams from a fuel cell (figure 1 and column 5, lines 1-3) and combusting the mixture catalytically (column 2, line 15 and column 4, line 2) and then venting the combustion product to the atmosphere thus having a reduced hydrogen content (figure 1 and column 5, line 3).

At the time of the invention it would have been obvious to one having ordinary skill in the art to include a mixing portion at the anode and cathode exhaust ports of Joerissen as taught by Boneberg in order to provide a spent gas mixture that could be catalytically combusted to fully utilize the reactant gases for heating the system as

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needed and therefore not wasting any reactant gases by venting them to the atmosphere.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joerissen et al. in view of DE 4219113 hereinafter Heinen et al.

Joerissen et al. as discussed above is incorporated herein.

Joerissen et al. does not teach the use of a diffusion member.

As per the provided German office action translation Heinen et al. teaches "off-gas tubes provided in the outlet portion with twisting or mixing elements or baffle plates to prevent a straight flowing of the off-gases and to promote the mixing-through with the ambient air (re claims 16 to 18 and 21 to 23, cf. (4) claims 1 and 3; column 1, lines 50 to 54; Fig. 2 with pertinent description)". The examiner notes that the mixing elements or baffle plates as taught by Heinen et al. are equivalent to the diffusion member or shield member of the instant application since the claimed structure is not specific as to what the actual member really is. And since the disclosure of the Heinen et al. reference performs the same function as the instant application it reads on the claims as so recited.

Joerissen et al. and Heinen et al. are analogous art because they are from same problem solving area of exhausting off gasses from a system after a reaction.

It would have been obvious to modify Joerissen et al. to include a shield or diffusion member at the exhaust port in order to prevent a straight flowing of the off-gases and to promote the mixing-through with the ambient air.

Claims 37-39 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joerissen et al. in view of Boneberg et al. as applied to claim 14 above, and further in view of U.S. Patent No. 2,850,038 hereinafter Shabaker.

Joerissen et al. as modified by Boneberg et al. does not teach any properties of the flow-rate reducing portion.

Shabaker teaches a flow control device for gaseous material employing variable diameter orifices that can in particular be smaller or larger depending on the control conditions (column 1, lines 15-21 and column 4, lines 3-60).

Joerissen et al. as modified by Boneberg et al. and Shabaker are analogous art because they are from similar problem solving area of controlling the flow of gases.

At the time of the invention it would have been obvious to one having ordinary skill in the art to include different diameter orifices as well as changing the volume of the flow rate reducing device (i.e. water separator) of Joerissen et al. as taught by Shabaker in order to properly remove all of the water from the anode exhaust so that it can be reused for humidification and cooling thereby optimally operating the system, because for example if the flow is too fast not enough water will be removed for reuse in the system and if the flow is too slow the system would get backed up and potentially flood the anode chamber thus rendering the fuel cell useless.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Hodge whose telephone number is (571) 272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER

RWH